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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/689,205	10/20/2003	Michael Willsch	2003P11942US01	4472

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Siemens Corporation  
Intellectual Property Department  
170 Wood Avenue South  
Iselin, NJ 08830

EXAMINER
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MCCALL, ERIC SCOTT

ART UNIT	PAPER NUMBER
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2855

DATE MAILED: 12/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/689,205	<b>Applicant(s)</b> WILLSCH ET AL.	
	<b>Examiner</b> Eric S. McCall	<b>Art Unit</b> 2855	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5, 12-15 and 17-21 is/are rejected.
- 7) ☒ Claim(s) 4, 6-11, 16 and 22 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>10/20/03&amp;11/24/03</u> . | 6) <input type="checkbox"/> Other: ____.  |

**METHOD AND APPARATUS OF MONITORING**  
**TEMPERATURE AND STRAIN BY USING FIBER BRAGG**  
**GRATING (FBG) SENSORS**

**FIRST OFFICE ACTION**

**CLAIMS**

**35 U.S.C. § 102**

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3, 5, 12-15, and 17-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Li et al. (2004/0184700).

With respect to claim 1, Li et al. teach a method of monitoring the condition of a thermal barrier coating within a turbine engine having an operating temperature in excess of 1200 degrees C, said method comprising:

embedding and thermally protecting a fiber lead (302) into the thermal barrier coating (306);

embedding at least one fiber Bragg grating sensor into the thermal barrier coating such that the fiber Bragg grating is affected by a thermal or mechanical expansion of the thermal barrier coating (page 4, paragraph 36); and

using the thermal or mechanical expansion of the thermal barrier coating to determine changes in temperature or strain of the thermal barrier coating (abstract).

With respect to claims 2 and 3, Li et al. suggest placing either the fiber lead or the fiber Bragg grating into a Nickel tube as claimed (page 2, paragraph 20).

With respect to claim 5, Li et al. suggest in fig. 3 thereof placing the fiber lead (302) into a "thin" hole of the substrate (308).

With respect to claim 12, Li et al. suggest embedding the fiber lead (302) inclined to the surface of a metal component (504) to which the thermal barrier coating is attached since the metal component (504) rotates (paragraph 40).

With respect to claim 13, Li et al. teach the fiber lead embedded in the thermal barrier coating (306) and a metal component (504) to which the thermal barrier coating is attached.

With respect to claim 14, the monitoring of Li et al. as set forth throughout the disclosure is interpreted as being performed “real-time or near real-time” as claimed.

With respect to claim 15, the fiber Bragg grating sensor of Li et al. is interpreted as being mounted on or within a carrier as claimed (Fig. 5).

With respect to claim 17, Li et al. teach an apparatus for monitoring the condition of a metal component, said apparatus comprising:

- a fiber lead (302) embedded into the metal component (306);

- at least one fiber Bragg grating sensor embedded into the metal component, such that the fiber Bragg grating is affected by a thermal or mechanical expansion of the metal component (page 4, paragraph 36); and

- a mechanism using the thermal or mechanical expansion of the metal component to determine changes in temperature or strain (abstract).

With respect to claim 18, Li et al. suggest the metal component as claimed is within a turbine engine (page 1, paragraph 4).

With respect to claim 19, the monitoring of Li et al. as set forth throughout the disclosure is interpreted as being performed “real-time or near real-time” as claimed.

With respect to claim 20, Li et al. teach a light source which will provide an incident spectrum which covers all wavelengths of the sensors (page 4, paragraph 40).

With regards to claim 21, Li et al. suggest a metal component within a turbine engine, comprising:

a fiber lead (302) embedded into said metal component;

at least one fiber Bragg grating sensor embedded into said metal component (page 4, paragraph 36), wherein the fiber Bragg grating is affected by a thermal or mechanical expansion of the metal component (abstract);

a light source which provides an incident spectrum which covers all wavelengths of the sensors (page 4, paragraph 40); and

a mechanism adopted to use the thermal or mechanical expansion of the metal component to determine changes in temperature or strain of the metal component (abstract).

Allowable Subject Matter

Claims 4, 6-11, 16, and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims because of the following:


Claim 4 has been found to contain allowable subject matter because the prior art fails to teach or suggest filling the tube as claimed with the material as claimed.

Claim 6 (and thus claims 7 and 8) has been found to contain allowable subject matter because the prior art fails to teach or suggest placing the fiber Bragg grating loose in a tube as claimed in combination with the remaining limitations from which the said claim depends.

Claim 9 (and thus claims 10 and 11) has been found to contain allowable subject matter because the prior art fails to teach or suggest placing the fiber lead loose in a hole as claimed in combination with the remaining limitations from which the said claim depends.

Claim 16 has been found to contain allowable subject matter because the prior art fails to teach or suggest the carrier being a ceramic carrier as claimed in combination with the remaining limitations from which the said claim depends.

Claim 22 has been found to contain allowable subject matter because the prior art fails to teach or suggest the metal component being coated with a ceramic thermal barrier coating as claimed in combination with the remaining limitations from which the said claim depends.



**RELEVANT ART**


The Applicant's attention is directed to the enclosed "PTO-892" form for the prior art made of record and not relied upon but considered pertinent to the state of the art of the Applicant's disclosure.

**CONCLUSION**

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Eric S. McCall whose telephone number is (571) 272-2183.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Eric S. McCall  
Primary Examiner  
Art Unit 2855  
Nov. 29, 2004